ditis). In tuberculous meningitis we have never found a single case in which the lesions in the meninges could be regarded as primary. The only two cases of apparently primary infection were in the two pneumococcus cases noted, and in one of these the infection may have come from the intestinal canal. We believe that all infections of the meninges other than the diplococcus intracellularis are fatal, but this can only be determined by microscopic and bacteriological examination of the exudation obtained during life by spinal puncture. If tubercle bacilli, pneumococci or streptococci are found with the evidences of meningitis in a case which recovers, it would settle the point; clinical evidence without lumbar puncture will not.

IMPLANTATION OF THE URETERS INTO THE RECTUM IN EXSTROPHY OF THE BLADDER, WITH A DESCRIPTION OF A NEW METHOD OF OPERATION.[1]

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The unsatisfactory character of the results following operations designed for the restoration of the anterior bladder wall in exstrophy of that organ has led surgeons to abandon these procedures. Among the most successful of the flap-operations is that introduced by Dr. Daniel Ayres, the immediate result, when the operation is finally accomplished, being to close the defect with skin-flaps in two layers, the cutaneous surface of one of which is directed toward the mucous membrane of the posterior wall of the bladder, the expectation being that this would finally perform the function, to a greater or less extent, of the normal lining of the bladder-wall. The final outcome of these attempts, in my experience, has been far from satisfactory. The growth of hair upon the vesical surface of the skin-flap which forms the anterior bladder-wall leads to the formation of calculous material and the necessity for further and repeated operative interference.

The constant flow of urine, despite every effort to divert this to an artificial channel opening upon the perineum frequently negatives efforts to obtain healing, whether these are directed toward remedying the defect by simple flap operations of the Ayres type or closure of the accompanying gap in the pubic symphysis, after the manner of Trendelenburg.

Trendelenburg's operation consists of a separation of the sacro-iliac articulation, in order to correct the pelvic bony fissure, and a direct suturing, after preliminary freshening of the edges, of the defect in the soft parts. König and Küster modified the procedure by substituting osteotomy of the anterior pelvic ring for forced separation of the sacro-iliac junction.[1] These procedures, as acknowledged by their originators, are exceedingly difficult of execution, and the resulting wounds are especially liable to become infected. Passavant proposed to accomplish closure of the pelvic bony gap by the application of "brisement forcé" under an anæsthetic. C. T. A. Koch, of Gronigen (Netherlands) succeeded in carrying out Passavant's proposition in a child of six years, the defect in the soft parts being closed by suturing the edges of the latter six weeks later. The case was reported one week following the second operation.[2]

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[1] Read before the Brooklyn Surgical Society, November 4, 1897.

In one of the most recent communications upon the subject, that of Tietze, of Mikulicz's clinic, all attempts to close the bony defect are abandoned, and the method of closure by lateral flaps is advocated.[3]

Even when the exstrophy of the bladder and the accompanying epispadias have been corrected, the patient's condition is not greatly improved. Attempts to restore the function of the muscular apparatus of the vesical neck have thus far yielded unsatisfactory results; a condition of incontinence persists, necessitating the wearing of an apparatus to lead the urine to a receptacle fastened to some part of the patient's body. Such an instrument is difficult of perfect adjustment, and this, together with its uncleanliness, in spite of every care, contributes to render the patient an object of disgust, both to himself and his friends.

These considerations impelled Maydl to suggest the application of ureteral implantation into the rectum in this class of patients.[4] This operation, designed to divert the urine from its normal course, however, has not met with marked favor among practical surgeons, on account of the threatened dangers of renal infection which the procedure invites. That these fears are not of a purely theoretical nature has been amply proved by the published clinical experiences, as well as the results of experiments upon lower animals, of Gluck and Zeller, Bardenheur, Tuffier, Smith, and others. More recently, however, attempted improvements in the technique of the operation have awakened renewed interest in the subject, these improvements being particularly designed to furnish protection against infection of the kidneys through the open mouths of the ureters, as these present themselves into the cavity of the rectum.

Four operative procedures have been recently brought forward with this end in view. The first of these, that of Maydl,[5] is designed to take advantage of the oblique course of the ureters upon the bladder-wall before entering the bladder, together with whatever safeguards are afforded by the arrangement of the mucous membrane of the bladder-wall at the vesical orifices of the ureters. The method of accomplishing this consists in transplanting the bas fond, together with the ureters, into the rectum. The second consists in implantation of the ureters into the space occupied by the submucous connective tissue of the rectal wall, turning back a triangular-shaped flap in a lateral direction for that purpose. A small opening is made in the mucous membrane for the passage of urine, and the flap is replaced and sutured (Krynski).[1] The third, the operation of Vignoni,[2] is recommended upon the basis of experiments upon animals, and aims to provide a V-shaped valve cut from the anterior wall of the bowel. After placing the ureters upon the flap, the former are covered by suturing over them two lateral folds of the bowel-wall. The fourth consists in transplantation of the bladder-wall at the sites of the ureters to the *posterior* wall of the rectum, through an incision in its anterior wall, a portion of mucous membrane having been removed in order to secure a freshened area for that purpose (Pisani[3]). The remainder of the bladder is extirpated.

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[1] Twenty-fifth Congress of German Surgeons.

[2] Centralblatt für Chirurgie, 1897, xxxvi. p. 953.

[3] Beitr. z. klin. Chir., Tubingen, 1897, xviii. p. 1-38, 2 pl.

[4] Wein. Med. Wochenschr., 1896, xlvii. pp. 1241, 1333, 1374.

[5] Op. cit.

In regard to the first-named, viz., the operation of Maydl, it may be said that the attempt to gain the advantages of pressure afforded by the arrangement of the ureters upon the bladder-wall, as well as whatever aid may be afforded by supposed valve-like folds of the vesical mucous membrane at the mouths of the ureters, are lost when the bas fond is transplanted into the rectum. The rectum proper is not a closed cavity in the sense that the bladder is, and accumulating urine cannot exercise pressure to the extent that this occurs in the case of the normal urinary viscus. In addition to this, the procedure requires an extensive dissection of the parts about the base of the bladder.

The second method, that of Krynski, places the ureters in the space occupied by the submucous connective tissue of the rectum. In order to gain access to this, a flap of the serous and muscular coats of the rectum is turned back, being afterward replaced and sutured. No valve is provided for at the mouths of the ureters, reliance being placed entirely upon the pressure of the rectal contents in occluding the ureters beneath the mucous membrane and above their point of entrance into the rectum. Pressure exercised in this manner, as has been shown, is fallacious in accomplishing its object.

In the third, or Vignoni's operation, while an effort is made to secure a valve for the prevention of regurgitation of urine into the ureter, this valve is covered upon its surface presenting to the mouths of the ureters by serous membrane. The objectionable feature of this method resides in the liability of stenosis of the orifices of the ureters occurring through adhesions between their cut ends and the serous covering of the flap.

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[1] Centralblatt für Chir., 1896, xxii. 73-75.

[2] Ibid., iv. p. 85; Gaz. med. di Torino. 1895, xlvi. 17-25.

[3] Ibid., 1897, xxii. p. 631; Policlin., Roma., 1896, iii. p. 333-338.

The fourth method, that of Pisani, is based upon a supposed sphincter-like action of the vesical mouths of the ureters. In this operation the ureters cross the rectum in an antero-posterior direction, and in this situation may readily form a more or less marked obstruction to the passage of feces. In addition to this, the supposed sphincter-like action of the ureters is alone relied upon to prevent the passage of feces into the ureters.

The method herewith presented is an effort to combine an efficient valve-action with the additional safeguard of compression of the ureters by the circular muscular fibres of the bowel during defecation. The operation is performed as follows: The abdomen is opened in the median line, with the patient in the Trendelenburg position. The anal sphincters are dilated and the rectum should be thoroughly cleansed preliminarily. The ureters are identified in their relations to the vessels, the posterior layer of the peritoneum incised for a sufficient extent to expose them freely, and the ureters traced to their terminations upon the bladder-wall, from which they are detached. The ends of the ureters are cut off obliquely (Fig. 1).

FIG. 1.

The obliquely cut ureter.

A longitudinal incision, 7 cms. long, is now made in the anterior wall of the rectum, only the serous and muscular coats being included in this incision. These structures are dissected laterally until the mucous coat is bared and a diamond-shaped space in the submucous space exposed (Fig. 2). The edges of the incision are retracted by thread retractors, and a tongue-shaped flap of mucous membrane, with its base directed upward, is cut from the mucous membrane in the lower half of the diamond. This tongue-shaped flap is doubled upon itself in an upward direction in such a manner that one-half of its mucous surface presents anteriorly, when it is secured by one or two catgut sutures. A flap-valve is thus secured, both sides of which are covered with mucous membrane.

The ureters are now placed in the incision, so that their obliquely cut ends lie upon the presenting mucous membrane surface of the flap (Fig. 3). A few fine catgut sutures serve to secure the ureters in position in the space represented in the upper half of the diamond, care being taken that these sutures do not invade the lumen of the ureters. The flap-valve and attached ends of the ureters are now pushed into the cavity of the rectum, and the rectal wound closed in the following manner: The gap in the mucous membrane left by the reflected half of the tongue-shaped valve is first closed by a row of catgut sutures (Fig. 4). The original wound in the rectal wall is closed by fine silk sutures, the upper two or three of these being likewise utilized for still further securing the ureters for the distance which they pass in the submucous space in the upper half of the diamond (Fig. 5). The abdominal wound is now closed.

FIG. 2.

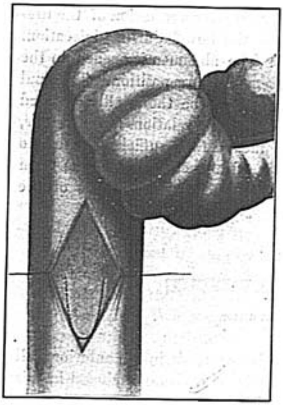

FIG. 3.

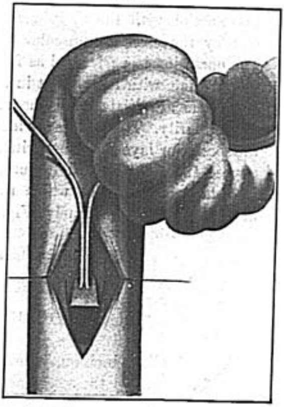

FIG. 2.—Incision on anterior wall of the rectum, including serous and muscular coats. Mucous membrane exposed in a diamond-shaped area, and the edges of the incision retracted by thread retractors. The dotted line shows line of section of mucous membrane to form the tongue-shaped flap.

FIG. 3.—Tongue-shaped flap cut, turned up, and laid upon itself (doubled back). The ureters are placed with their obliquely cut ends lying upon the surface of the flap and secured by catgut sutures in the space in the upper half of the diamond.

A boy, aged six years, referred to me by Dr. McCleary, of this city, was subjected to this operation on September 20, 1896, at the Brooklyn Hospital. Prompt recovery followed the operation. The rectum became remarkably tolerant of the presence of urine from the first day following the restoration of the sphincters, urination taking place per rectum on an average of every three hours. As time passed this toleration became more pronounced, until, at the present time, the intervals do not average more than the normal.

A remarkable fact, brought out by the after-history of this case, is the manner in which the bowel performs its double function as a receptacle for both feces and urine. While urination takes place at about the normal intervals, defecation likewise takes place at normal intervals, although the former occurs about once in six hours, while the latter occurs but once daily. The movement is generally formed, and is not mixed with or accompanied by urine, as far as gross appearances can determine.

FIG. 4.

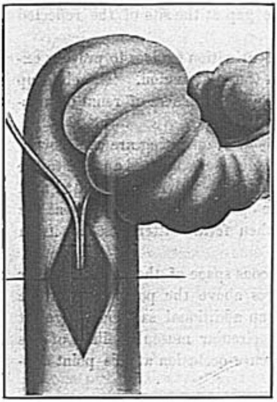

FIG. 5.

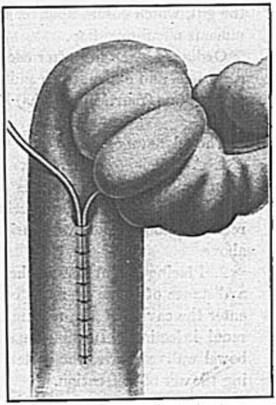

FIG. 4.—Flap-valve and ends of ureters placed in the rectum, and a row of catgut sutures closing the gap in the mucous membrane.

FIG. 5.—Showing the longitudinal incision in the bowel-wall closed by a row of silk sutures. The ureters are shown passing into the upper angle of the closed incision.

In explanation of this the observations of O'Bierne should be borne in mind. This investigator demonstrated by explorations in the human subject that, in the normal state, between the acts of defecation the walls of the rectum are in contact and its cavity practially empty. Under these cirumstances, the accumulation of feces takes place above the contracted upper portion of the rectum or at the site of the so-called sphincter of O'Bierne. Every surgeon is familiar with the fact that section or paralysis of the anal sphincters is not necessarily followed by a constant flow of feces; but, on the contrary, this is more or less intermittent, showing that there exists a receptacle for feces above the rectum proper, or at the sigmoid flexure. The act of defecation, therefore, is preceded by the passage of feces from the sigmoid flexure into the rectum. This sensation of emptying of the sigmoid, followed by the presence of feces in the rectum, gives rise to the desire to evacuate the bowels. Thus there are practically two receptacles at the lower portion of the large intestine: the one the sigmoid, intended for the storage of feces; while the other serves only for its temporary arrest until a convenient opportunity is afforded for its evacuation.

Thus is explained the behavior of the rectum in the case before us. The rectum serves as a receptacle for the urine, while the sigmoid flexure, and the parts above, perform the same office for the feces. This latter is probably favored by the slightly increased narrowing of the gut, which ensues upon closing the gap at the site of the reflected mucous membrane flap.

Ordinary cleansing after each act of urination suffices to prevent excoriations and eczematous conditions in the anal region. The child up to this time (fourteen months) has shown no evidences of renal disturbance.

The advantages claimed for this method of operating are as follows:

1. An efficient permanent valve, with a mucous surface applied to the open mouths of the ureters, is provided. This valve is so situated that it is closely applied to and occludes the open ends of the ureters as the rectum becomes filled with urine, or when fecal matter descends from above.

2. Placing the ureters in the submucous space of the rectal wall for a distance of three or more centimetres above the point where these enter the cavity of the rectum affords an additional safeguard against renal infection. In this situation the circular muscular fibres of the bowel wall compress the ureters and secure occlusion at this point during the act of defecation.

MOUNTAIN FEVER.[1]

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Different clinical observers who have recorded their observations upon the etiology and symptomatology of this fever for the past twenty years have classified it nosologically as typho-malarial fever, indicating thereby a mixed infection and committing themselves to the doctrine of hybridity of disease; again, as malarial remittent with adynamic tendencies; and, lastly, as typhoid fever indigenous to mountain regions, its clinical history modified by surrounding physical conditions, the

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[1] By permission of the Surgeon-General, U. S. Army.